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EXAMINER	
STEELE, JENNIFER A	

ART UNIT	PAPER NUMBER
1782	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/552,163	ORLANDI ET AL.	
	Examiner	Art Unit	
	JENNIFER STEELE	1782	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *53-101* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *53-101* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Election/Restrictions

1. Applicant's election with traverse of a nonwoven article in the reply filed on 4/9/2010 is acknowledged. The traversal is on the ground(s) that as the claims were amended to recite the splittable multi-filament layer is not previous subjected to a bonding step. This is persuasive because the prior art, Vonfelt, teaches splitting the multifilaments prior to hydroentangling the split fiber web to the pulp web. The process of splitting the filaments is a hydroentangling process which is a bonding process. Vonfelt also teaches thermal bonding the split fiber web prior to hydroentangling with the pulp fiber web. The restriction over method claims 60-65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 84, 86, 88 and 90 is also withdrawn as the special technical feature of exploded fibers in combination with a pulp layer is not found in the prior art.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 53-59, 66, 68, 70, 72, 74, 76, 78, 80, 82, 85, 87, 89 and 91-101 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

a. Claims 91-101 include the limitation that the “at least one layer (T_1) of exploded polymer fibers has not been previously subjected to a bonding step”. The specification refers to the steps of producing the nonwoven in paragraphs [0024] (page 10) of the specification originally filed and on paragraphs [0040]-[0044] of the PG PUB. This disclosure presents the steps where the first layer (T_1) is prepared and laying absorbent layer (T_3) on first layer (T_1) and then laying a second layer (T_2) on the absorbent layer and then the layers are hydroentangled. The specification does not describe that layer (T_1) is "not bonded" prior to the applying the other layers (T_3) and (T_2). Any negative limitation or exclusionary proviso must have basis in the original disclosure. The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. See *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), *aff’d mem.*, 783 F.2d453 (Fed. Cir. 1984).

The specification teaches two embodiments as shown in Fig. 1b and 1c. Fig. 1b is described in paragraphs [0028]-[0029] of the specification (paragraphs [0048] of the PG Pub) and refers to layer T1 of splittable multi-component polymer fibers as a spun-bonded nonwoven fabric, inferring that the filaments are bonded.

> [0048] As shown in FIG. 1B, once a layer of splittable multi-component polymer fibers has been laid through the special spinneret 5 onto a conveyor belt S such as to create a first layer of **spun-bonded non-woven fabric T.sub.1**, one layer of absorbent material T.sub.3 such as cellulose pulp is laid on said layer of non-woven fabric.

> [0049] Subsequently, a second layer T.sub.2 of non-woven fabric substantially identical to that prepared previously is laid on the layer of cellulose pulp T.sub.3, as represented in FIG. 1B by the station identified with reference number 7.

Fig. 1c describes a process where the splittable fiber web is hydroentangled prior to depositing the pulp fiber web and subsequently hydroentangling together. While it is clear that Applicant teaches an embodiment where the splittable fiber layer (T_1) is not hydroentangled prior to depositing the pulp layer onto splittable fiber layer (T_1), it is not clear whether or not there is an additional bonding step that creates a spunbonded fabric as described. The term spunbonded implies the web is bonded.

Applicant also describes in paragraph [0074] “the process of the present invention advantageously allows to eliminate the lengthy and costly steps of adhesion and/or pretreatment of the fibers”. Adhesion does not encompass the broader term bonding and one of ordinary skill in the art would not equate pretreatment with bonding as pretreatment could encompass other types of processes.

b. Claim 92, 94, 96, 98, 100 and 101 describe an exploded fiber and then claims “such as to obtain a non-woven where the multi-component polymer fibers are split into mono-component micro-fibers entangling one another". The specification teaches there are splittable multicomponent fibers and there are exploded fibers produced with a Laval nozzle. The specification does not teach the exploded fibers are multi-component fibers and they are split.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 56 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 56 describes a spinneret nozzle (5, 7, 11, 15). It is unclear what the notation (5, 7, 11, 15,) refers to and therefore the claim is indefinite.

4. Claim 72 recites the limitation "pre-hydroentangling step" in line 2 of claims 72. There is insufficient antecedent basis for this limitation in the claim. Claim 53 from which claim 72 depends, recites the limitation that the T1 layer is not bonded prior to hydroentangling with the pulp layer. Pre-hydroentangling is a bonding process and therefore claim 72 can not be dependent on claim 53 which states that there can not be a bonding or pre-bonding step.

5. Claim 92, 94, 96, 98, 100 and 101 recites the limitation "multicomponent polymer fibers split into mono-component micro-fibers" in lines 6 and 7. There is insufficient antecedent basis for this limitation in the claim. Line 3 of claim 92 states that layer T1 is prepared with exploded fibers. It is unclear if the exploded fibers are equated with the multi-component fibers that are split.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claim 53, 54, 56, 59, 66, 68, 70, 72, 74, 76, 78, 80, 85, and 91-96 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Vonfelt et al (US 6,739,023).** Claim 53 describes a process for the production of a nonwoven, comprising the following manufacturing steps:

- Preparing at least one layer (T_1) of splittable multicomponent polymer fibers and
- At least one layer of cellulose pulp fibers (T_3); and
- Hydroentangling said at least one layer of splittable multi-component polymer fibers and said at least one layer of cellulose pulp fibers (T_3) such as to obtain a nonwoven where the multicomponent polymer fibers are split into monocomponent microfibers entangling with one another
  - Wherein the said at least one layer (T_1) of splittable multi-component polymer fibers has not been previously subjected to a bonding step.

Gilmore is directed to a process for forming a nonwoven fabric by hydroentangling. Gilmore teaches at least one layer of textile fibers or net of polymeric filaments and at least one web of meltblown microfibers bonded together by hydroentangling (ABST).

Gilmore's process as shown in Fig. 1 a web of drawn continuous filament textile fibers can be prepared by extruding a thermoplastic polymer from extruder 12 through a plate 13 containing fine orifices into a chamber 14 where the molten fibers solidify. The fibers are strengthened by drawing them in tubes 15 filled with high velocity air. The fibers are deposited from tubes 15 onto foraminous continuous belt 16 (col. 8, lines 61-68). The continuous filaments can be bicomponent fibers (col. 5, lines 33-37). The continuous filaments can also be textile fiber such as staple fibers of cellulosic fibers (col. 6, lines 17-24).

Gilmore teaches meltblown fibers are extruded from extruder 21 through melt blowing die 22 which deposits a web onto the web of drawn continuous filaments. The two layers are then transferred to wire 18 and pass under water jet manifolds (col. 9, lines 1-25). The water jet manifolds are equated with the hydroentangling process (col. 9, lines 67) which produces a composite fabric.

Gilmore teaches a continuous filament layer is produced and a meltblown fiber layer is deposited on the continuous filament layer and the layers are hydroentangled for form a composite fabric. While Gilmore does not explicitly teach the continuous filament layer is not bonded prior to hydroentangling with the meltblown layer, the

process described and shown in Fig. 1 does not have a bonding step prior to depositing the meltblown fibers and hydroentangling the fibers together.

Gilmore differs and does not teach the continuous filaments are splittable multicomponent fibers and does not teach the meltblown fibers are pulp. Gilmore teaches a nonwoven fabric has favorable softness, dryness, tensile strength and hand (col. 2, lines 41-42). Gilmore teaches the high pressure liquid entangles the fibers such that the fibers interlock to form a fabric (col. 3, lines 24-28). Gilmore teaches a bicomponent filament which is multicomponent fiber. Gilmore teaches a meltblown fiber which is of fine denier. Gilmore also teaches embodiments of staple cellulose fibers and meltblown fibers and therefore suggests a cellulosic fiber in the web.

Vonfeldt teaches a method of forming a nonwoven composite fabric that includes the steps of providing a first layer of splittable continuous fibers, splitting the fibers into split filaments and superimposing a second layer of staple fibers and entangling the first and second layers together (ABST). Vonfeldt teaches the staple fibers are pulp fibers (col. 3, lines 50-53). Vonfeldt teaches the splittable fibers are multicomponent fibers (col. 2, lines 37-42). Vonfeldt teaches the fibers are hydroentangled (col. 2, lines 8-21).

As to claims 53 and 91, it would have been obvious to substitute the bicomponent filaments of Gilmore with the splittable multicomponent filaments of Vonfelt motivated to produce a hydroentangled nonwoven composite with the softness that microfine fibers provide. It further would have been obvious to substitute pulp fibers for the meltblown fibers motivated to improve the absorbency of the nonwoven fabric.

As to claim 54, Gilmore differs and does not teach splittable filaments. Vonfelt teaches the process of hydroentangling splits the filaments as well as entangling the filaments with the pulp.

As to claim 56, Gilmore differs and does not teach a bicomponent filament that is a splittable filament. Vonfelt teaches splittable multicomponent fibers are produced by any known methods such as those by US 5,759,926 to Pike incorporated by reference. Vonfelt teaches multicomponent fibers that have varying individual segments. Vonfelt teaches the greater the number of segments, the greater the potential for forming lower denier fibers. The splittable fibers are linked to form a single multi-component fiber.

As to claim 59, Gilmore differs and does not teach splittable fibers. Vonfelt teaches the splittable multi-component fibers can be produced from polyethylene or polypropylene, which are polyolefins, nylon 6 which is a polyamide, polyethylene terephthalate which is a polyester.

As to claims 54, 56 and 59, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ splittable multicomponent fibers from the claimed polymers motivated to produce a nonwoven fabric with the desired strength and softness.

As to claim 66, Gilmore teaches staple cellulose fibers. Vonfelt teaches cellulose pulp fibers and pulp fibers are equated with staple fibers (col. 3, lines 50-53).

As to claim 68, Gilmore teaches a drying step after hydroentangling (col. 10, lines 1-10).

As to claim 70, Gilmore teaches the fabric can be wound on a roll (col. 10, lines 21-24).

As to claim 72, Gilmore differs and does not teach the layer of continuous filaments is hydoentangled prior to being combined with the secondary layer of meltblown fibers. Vonfelt teaches the layer of splittable multicomponent filaments is subjected to a hydroentangling process in order to split the multicomponent filaments prior to being hydroentangled with the layer of pulp fibers (col. 6, lines 1-38). The purpose of pre-hydroentangling the split fiber layer is to allow the full energy of the water jets to split the fibers. When the splittable web is combined with the pulp web, the pulp web absorbs some of the energy and results in lower splitting efficiency (col. 6, lines 27-38). It would have been obvious to one of ordinary skill in the art at the time the invention was made to pre-hydroentangle the split fiber web motivated to improve the number of fibers that are split, i.e. split efficiency.

As to claim 74, Gilmore differs and does not teach the layer of continuous filaments is hydoentangled prior to being combined with the secondary layer of meltblown fibers and therefore does not teach the pre-hydroentangled layer is dried after the pre-hydroentangled step. Vonfelt teaches the layer of splittable multicomponent filaments is subjected to a hydroentangling process in order to split the multicomponent filaments prior to being hydroentangled with the layer of pulp fibers (col. 6, lines 1-38). The purpose of pre-hydroentangling the split fiber layer is to allow the full energy of the water jets to split the fibers. When the splittable web is combined with the pulp web, the pulp web absorbs some of the energy and results in lower splitting

efficiency (col. 6, lines 27-38). Gilmore does teach that the composite fabrics are dried after hydroentangling and therefore it would have been obvious to dry the fabric after hydroentangling motivated to remove moisture from the high pressure water jets and provide a dry layer to combine with the pulp layer.

As to claim 76, 78 and 80, Gilmore teaches a drying step after hydroentangling (col. 10, lines 1-10). Gilmore teaches transporting the fabric around the surface of hot cans or a felt may be used to hold the fabric against the hot drying cans or other drying methods can also be utilized. A drying step is equated with a dewatering step as both processes remove water from the fabric. Gilmore teaches calendaring (col. 10, lines11-20) after drying but before winding the fabric on a roll.

As to claim 85, Gilmore and Vonfelt teach the hydroentangled fibers are produced to form a nonwoven fabric. Gilmore teaches the nonwoven can be calendered and thermal bonded. These process steps are equated with a nonwoven finishing step.

As to claim 92, splittable microfibers are equated with exploded fibers. Applicant's specification teaches an exploded fiber is produced by a Laval nozzle, which is a specific process. It should be noted that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or an obvious variant from a product of the prior art, the claim is unpatentable even though a different process made the prior product. In re Thorpe, 227 USPQ 964,966 (Fed. Cir. 1985). The burden has been shifted to the Applicant to show unobvious differences between the

claimed product and the prior art product. In re Marosi, 218 USPQ 289,292 (Fed. Cir. 1983).

As to claim 93, 94 and 96, Gilmore teaches a layer of meltblown microfibers that have an average fiber diameter of 2 to 6 microns (col. 6, lines 17-24).

As to claim 95, Gilmore differs and does not teach the dtex of the microfibers. Vonfeldt teaches a layer of split fibers and a layer of staple fibers and teaches the split fibers have a denier less than about 0.7 and less than about 0.1 and less than 0.01 (col. 5, lines 1-11). A denier of less than 0.7 is equal to 0.77 dtex and in the claimed range. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ microfibers in the claimed dtex range motivated to produce a fabric with the desired weight, softness and texture.

7. **Claim 55, 99, 100 and 101 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Vonfelt et al (US 6,739,023) and in further view of Skoog et al (US 6,177,370).**

As to claim 55, Gilmore in view of Vonfelt differ and do not teach a three layer nonwoven with two multicomponent layers sandwiching a pulp layer. Skoog teaches a nonwoven with synthetic fiber layers 120 and 140 with pulp layer 160 in the middle. Skoog hydroentangles the layers together to mix the fibers and produce an absorbent fabric with improved abrasion resistance and the composite requires no additional bonding after hydroentangling.

It would have been obvious to employ a secondary split fiber layer to sandwich the pulp layer motivated to produce a fabric with improved abrasion resistance while maintaining the absorbency of the nonwoven which the pulp layer layer provides.

As to claims 99 and 100, Gilmore teaches 2 layer webs with individual basis weights of 8.4 GSY, 17 GSY, 23 GSY and 36 GSY which are equivalent to 10 gsm, 21 gsm, 28 gsm and 44 gsm. The total weight of the web would be in the claimed range of 48 to 65 gsm. The basis weights of the layers are in the claimed ranges of 11-13 gsm for the upper or lower layer and 26-29 gsm pulp layer. However Gilmore and Vonfelt differ and do not teach a three layer laminate and does not specifically teach the pulp layer with the claimed basis weight.

Gilmore teaches the caliper of the webs which is a measure of thickness under a compression (col. 19, lines 34-39). Gilmore lists the calipers, measured in mils in Table 2 between 11 to 58 mils under 19 g/sq in compression and 8 to 32 under 131 g/sq in compression. These thicknesses are equivalent to 0.3 mm to 1.5 mm and 0.2 to 0.8 mm and in the claimed range.

Gilmore teaches it is desirable to produce a nonwoven with good tensile strength without destroying the softness and drape. Gilmore teaches the tensile strength measured by ASTM D168264 in the MD and CD directions are between 700-4909 grams per inch in the MD direction and 170 to 1425 grams per inch in the CD direction (col. 19, lines 16-25, and Table 2). Converting to N/5 cm, these values are equal to 13 to 95 N/ 5 cm in the MD direction and 3.25 to 27.5 in the CD direction and in the claimed range of Gilmore.

Skoog teaches a three layer laminate where layer 120 and 140 have basis weights of from about 12 to about 50 gsm and layer 160 of pulp fibers has a basis weight of 28 to 165 gsm (col. 4, lines 44-67).

It would have been obvious to employ the basis weights as claimed motivated to produce a three layer, absorbent laminate with the desired weight, absorbency and drape.

As to claims 101, the claim is drawn to a statement of use and does not distinguish the claims from prior art of Vonfeldt. However, Vonfeldt teaches a single or multi-layer nonwoven comprised of splittable multicomponent filaments and Vonfeldt teaches employing the splittable filaments with other layers and with absorbent materials such as cellulose pulp fibers.

8. **Claim 57 and 58 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Vonfelt et al (US 6,739,023) and in further view of Murase et al (US 5,718,972).** As to claim 57 and 58, Gilmore in view of Vonfelt differ and do not teach the splittable multi-component fiber is obtained by spinning and linking up to 16 continuous threads of different polymers.

Murase teaches a nonwoven fabric made of fine denier filaments (Title). Murase teaches the nonwoven fabric is made of bicomponent conjugate filaments that are split by applying water jet needling. Murase teaches the filaments has a structure where there are 16 radial segments and a center hollow segment. The 16 radial segments would split into 16 threads. As to claim 57, Murase teaches splittable multi-component

fiber is obtained by spinning and subsequently linking up to 16 continuous threads of different polymers. As to claim 58, Murase teaches the 16 radial segments would be split into the 16 thread of different polymers.

It would have been obvious to employ a splittable fiber structure as taught by Murase motivated to produce the desired fineness and fiber mixture in the nonwoven fabric.

9. **Claim 97 and 98 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Vonfelt et al (US 6,739,023) and in further view of Everhart et al (US 5,284,703).**

As to claim 97, Gilmore teaches the basis weight of the microfiber web can be 8.4 GSY or 23 GSY or 36 GSY in examples 1 and 2-7 (col. 15, lines 38-65). Gilmore combines the meltblown microfiber web with a 17 GSY web in example 7 (col. 16, lines 9-11). The combined weight of the web in example 7 is 53 GSY or 64 gsm and in the claimed range. Vonfelt teaches the basis weight of the splittable fiber web is about 10 to about 70 gsm (col. 5, lines 32-38). It would have been obvious to produce a microfiber web in the claimed basis weight range.

Gilmore teaches it is desirable to produce a nonwoven with good tensile strength without destroying the softness and drape. Gilmore teaches the tensile strength measured by ASTM D168264 in the MD and CD directions are between 700-4909 grams per inch in the MD direction and 170 to 1425 grams per inch in the CD direction (col. 19, lines 16-25, and Table 2). Converting to N/5 cm, these values are equal to 13

to 95 N/ 5 cm in the MD direction and 3.25 to 27.5 in the CD direction and in the claimed range of Gilmore.

Gilmore teaches a strip elongation of the fabric and presents the results in Table 2. The strip elongation is measured by ASTM D1682-64 and does not measure the elongation as claimed (col. 19, lines 27-31). As Gilmore in view of Vonfelt teach the same materials and structure as claimed and Gilmore teaches the fabric has the property of elongation, it is reasonable to presume the property of elongation could have been optimized to achieve the desired results.

Gilmore differs and does not teach the percentage of pulp in the nonwoven fabric. Vonfelt teaches a pulp layer however differs and does not teach the percentage of pulp in the nonwoven. Gilmore and Vonfelt differ and do not teach the absorbency of the web as claimed.

Everhart teaches a high pulp content nonwoven composite fabric (Title). Everhart teaches a composite fabric composed of more than about 70% by weight pulp fibers which are hydraulically entangled into a continuous filament substrate (ABST). Everhart teaches the absorbent properties expressed as water wicking and oil absorbency in Tables 1, 2 and 3. Everhart teaches the water absorbent capacity percentage is 526%, 551%, 555% and 738% in Table 2 (col. 17, lines 60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the claimed percentage of pulp fibers motivated to increase the absorbency of the web.

10. **Claim 82 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Vonfelt et al (US 6,739,023) and in further view of Midkiff et al (US 5,707,735).**

As to claim 82, Gilmore and Vonfelt differ and do not teach the quench air temperature that is used to cool the filaments after being extruded from the spinnerette. Midkiff teaches a conjugate fiber that can be split and formed into a nonwoven fabric (col. 2, lines 1-10). Midkiff teaches the process of producing the conjugate fiber filaments are extruded from spinneret 18 and a stream of air from the quench air blower 20 at least partially quenches the filaments. The air temperature is about 45 degrees to about 90 degrees F (col. 10, lines 40-45). About 45 degrees is below room temperature.

It would have been obvious to one of ordinary skill in the art to cool the filaments with air at a temperature equal to or lower that room temperature motivated to achieve the cool the fibers quickly to reduce inadvertent bonding of molten fibers when the fibers are deposited on the conveyor.

11. **Claim 87 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Vonfelt et al (US 6,739,023) and in further view of Murakami et al (US 4,735,849).** Gilmore in view of Vonfelt differ and do not teach the nonwoven comprises a multicolor printing step. Murakami teaches a nonwoven web produced from splittable fibers where the fabric is dyed by means of spray printing or multi-color printing (col. 10, lines 25-35). It would have been obvious

to print or dye the fabric motivated to produce a fabric that is colorful and aesthetically pleasing.

12. **Claim 89 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Vonfelt et al (US 6,739,023) and in further view of Hills et al (US 6,338,814).** Glimore in view of Vonfelt differ from the current application and do not teach the fibers are deposited on an inclines support with an incline angle of between 10 to 50 degrees.

Hills teaches a spunbond web formation apparatus includes a spinneret that extrudes an array of fibers that are drawn into an aspirator. The attenuated fibers are discharged from the aspirator and are deflected sideways by a coada device that entrains the exiting air stream along with the fibers. The fibers are deposited on a vertically moving belt and subsequently bonded by calendar rolls (ABST). Hills teaches the fibers can be splittable fibers (col. 14, lines 51-65). Hills teaches the fibers are deposited onto a short inclined web forming belt disposed at an angle of approximately 30 degrees with respect to the vertical such that the fibers approach the belt substantially perpendicularly (col. 12, lines 11-54).

Hills presents a finding that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the processing technique of an inclined conveyor in the process of Gilmore and Vonfelt and the results of the combination would have been predictable in producing a split fiber nonwoven fabric.

13. **Claim 60, 61, 63, 64, 65, 67, 69, 71, 77, 79, 81, 86 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Piotrowski et al (US 4,642,262).**

As to claim 60, Gilmore teaches a nonwoven fabric produced from continuous filament extruded from a spinneret and then hydroentangled into a fabric. Gilmore teaches a staple cellulose fiber can be combined with a meltblown fiber layer or a continuous filament layer can be combined with a meltblown layer and differs and does not teach an exploded fiber layer. Gilmore differs and does not teach exploded fibers. Applicant describes exploded fibers are fibers that are extruded through a Laval nozzle.

Piotrowski is directed to a method of making fibrids from thermoplastics (ABST). Fibrids are understood to be fibers with a highly oriented longitudinal direction and have a cellulose-like structure (col. 1, lines 18-22). Piotrowski teaches a method of making fibrids by extruding a thermoplastic polymer through a Laval nozzle which creates a high velocity propulsion of the polymer solution which can contain a percentage of gaseous solvent is achieved by means of a jet of steam in a two substance mixing nozzle operating on the principle of a laval nozzle. The liquid stream is broken up and the solvent is vaporized and carried out by the steam. The fibrids are prepared into nonwovens.

As to claim 60, it would have been obvious to one of ordinary skill in the art to substitute the spinning process of Gilmore with a Laval nozzle orifice motivated to produce a fiber and resultant fabric that is cellulose-like.

As to claim 61, Gilmore teaches a staple cellulose fiber can be combined with a meltblown fiber layer or a continuous filament layer can be combined with a meltblown layer and differs and does not teach an exploded fiber layer. Piotrowski teaches an exploded fiber. It would have been obvious to substitute the meltblown layer with an exploded fiber layer motivated to produce a fabric with a fine fiber that provides softness and absorbency.

As to claim 63, Gilmore differs and does not teach an exploded fiber. Piotrowski teaches a method of making fibrids by extruding a thermoplastic polymer through a Laval nozzle which creates a high velocity propulsion of the polymer solution which can contain a percentage of gaseous solvent is achieved by means of a jet of steam in a two substance mixing nozzle operating on the principle of a laval nozzle. The liquid stream is broken up and the solvent is vaporized and carried out by the steam. The fibrids are prepared into nonwovens.

It would have been obvious to one of ordinary skill in the art to substitute the spinning process of Gilmore with a Laval nozzle orifice motivated to produce a fiber and resultant fabric that is cellulose-like.

As to claim 64 and 65, Gilmore differs and does not teach an exploded fiber. Piotrowski teaches the fibrids are produced from thermoplastics synthetics and copolymers (ABST) such as polyolefins, polyvinyl halides, polyesters, polyacrylonitrile, polyamides, polyvinyl lactam (col. 1, lines 7-15). It would have been obvious to one of ordinary skill in the art to substitute the spinning process of Gilmore with a Laval nozzle orifice motivated to produce a fiber and resultant fabric that is cellulose-like.

As to claim 67, Gilmore teaches staple cellulose fibers.

As to claim 69, Gilmore teaches a drying step after hydroentangling (col. 10, lines 1-10).

As to claim 71, Gilmore teaches the fabric can be wound on a roll (col. 10, lines 21-24).

As to claim 77, 79 and 81, Gilmore teaches a drying step after hydroentangling (col. 10, lines 1-10). Gilmore teaches transporting the fabric around the surface of hot cans or a felt may be used to hold the fabric against the hot drying cans or other drying methods can also be utilized. A drying step is equated with a dewatering step as both processes remove water from the fabric. Gilmore teaches calendaring (col. 10, lines11-20) after drying but before winding the fabric on a roll.

As to claim 86, Gilmore and Vonfelt teach the hydroentangled fibers are produced to form a nonwoven fabric. Gilmore teaches the nonwoven can be calendered and thermal bonded. These processes steps are equated with a nonwoven finishing step.

14. **Claim 62 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Piotrowski et al (US 4,642,262) and in further view of Skoog et al (US 6,177,370).** Gilmore in view of Piotrowski differ and do not teach a three layer sandwich structure with a central pulp layer. Skoog teaches a nonwoven with synthetic fiber layers 120 and 140 with pulp layer 160 in the middle. Skoog hydroentangles the layers together to mix the fibers and produce an absorbent

fabric with improved abrasion resistance and the composite requires no additional bonding after hydroentangling.

It would have been obvious to employ a secondary split fiber layer to sandwich the pulp layer motivated to produce a fabric with improved abrasion resistance while maintaining the absorbency of the pulp layer.

15. **Claim 73 and 75 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Piotrowski et al (US 4,642,262) and in further view of Vonfelt et al (US 6,739,023).** As to claim 73, Gilmore in view of Piotrowski differs and does not teach the layer of continuous filaments is hydoentangled prior to being combined with the secondary layer of meltblown fibers. Vonfelt teaches the layer of splittable multicomponent filaments is subjected to a hydroentangling process in order to split the multicomponent filaments prior to being hydroentangled with the layer of pulp fibers (col. 6, lines 1-38).

As to claim 75, Gilmore in view of Piotrowski differs and does not teach the layer of continuous filaments is hydoentangled prior to being combined with the secondary layer of meltblown fibers and therefore does not teach the pre-hydroentangled layer is dried after the pre-hydroentangled step. Vonfelt teaches the layer of splittable multicomponent filaments is subjected to a hydroentangling process in order to split the multicomponent filaments prior to being hydroentangled with the layer of pulp fibers (col. 6, lines 1-38).

Gilmore does teach that the composite fabrics are dried after hydroentangling and it would have been obvious to dry the fabric after hydroentangling motivated to remove moisture from the high pressure water jets and provide a dry layer to combine with the pulp layer.

16. **Claim 83 and 84 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Piotrowski et al (US 4,642,262) and in further view of Midkiff et al (US 5,707,735).**

As to claim 83, Gilmore and Piotrowski differ and do not teach the quench air temperature that is used to cool the filaments after being extruded from the spinnerette. and formed into a nonwoven fabric (col. 2, lines 1-10). Midkiff teaches the process of producing the conjugate fiber filaments are extruded from spinneret 18 and a stream of air from the quench air blower 20 at least partially quenches the filaments. The air temperature is about 45 degrees to about 90 degrees F (col. 10, lines 40-45). About 45 degrees is below room temperature.

It would have been obvious to one of ordinary skill in the art to cool the filaments with air at a temperature equal to or lower that room temperature motivated to achieve the cool the fibers quickly to reduce inadvertent bonding of molten fibers when the fibers are deposited on the conveyor.

As to claim 84, Gilmore and Piotrowski differ and do not teach the quench air temperature that is used to cool the filaments after being extruded from the spinnerette. Piotrowski does teach steam is used to as the gas that provides the high velocity

propulsion. Steam is water vapor and therefore would humidify the fibers. The combination of Piotrowski's steam propulsion gas and the cooler quench air of Midkiff would produce a cool and humid fiber treatment prior to hydroentangling.

17. **Claim 88 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Piotrowski et al (US 4,642,262) and in further view of Murakami et al (US 4,735,849).** Gilmore in view of Piotrowski differ and do not teach the nonwoven comprises a multicolor printing step. Murakami teaches a nonwoven web produced from splittable fibers where the fabric is dyed by means of spray printing or multi-color printing (col. 10, lines 25-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to print or dye the fabric motivated to produce a fabric that is colorful and aesthetically pleasing.

18.

19. **Claim 90 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmore et al (US 5,369,858) in view of Piotrowski et al (US 4,642,262) and in further view of Hills et al (US 6,338,814).** Glimore in view of Piotrowski differ from the current application and do not teach the fibers are deposited on an inclines support with an incline angle of between 10 to 50 degrees.

Hills teaches a spunbond web formation apparatus includes a spinneret that extrudes an array of fibers that are drawn into an aspirator. The attenuated fibers are discharged from the aspirator and are deflected sideways by a coada device that

entrains the exiting air stream along with the fibers. The fibers are deposited on a vertically moving belt and subsequently bonded by calendar rolls (ABST). Hills teaches the fibers can be splittable fibers (col. 14, lines 51-65). Hills teaches the fibers are deposited onto a short inclined web forming belt disposed at an angle of approximately 30 degrees with respect to the vertical such that the fibers approach the belt substantially perpendicularly (col. 12, lines 11-54).

Hills presents a finding that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the processing technique of an inclined conveyor in the process of Gilmore and Vonfelt and the results of the combination would have been predictable in producing a split fiber nonwoven fabric.

Response to Arguments

20. Applicant's arguments, with respect to Vonfelt have been fully considered and are persuasive. The 35 USC 102/103 rejection over Vonfelt has been withdrawn.

21. Applicant's arguments with respect to the restriction requirement are persuasive and the process claims 53-90 are examined in this Office Action.

22. Applicant's arguments with respect to Vonfelt and Marmon in view of Palacio are moot in view of the new grounds of rejection.

23. Applicant's arguments with respect to the 35 USC 112 1st paragraph rejection are not persuasive. The claim limitation of not bonded is a negative limitation and applicant is required to provide specific teaching of the negative limitation in the specification.

The rejection has been revised to respond to Applicant's apparent opinion of the disclosure of not bonded. Bonded is a broad term that encompasses many different processes. It is clear that the process disclosed in the specification (Fig. 1b) has no bonding steps between the filaments being deposited on the conveyor and then the pulp being deposited on the filaments. However the claim states the process “comprises” the steps and therefore does not exclude addition steps. The specification also teaches another process (Fig. 1c) where the filaments are hydroentangled prior to pulp being deposited onto the filaments. There is a clear teaching that the splittable multi-component fibers have not been previous subjected to a hydroentangling step.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER STEELE whose telephone number is (571)272-7115. The examiner can normally be reached on Office Hours Mon-Fri 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S./
Examiner, Art Unit 1782

7/29/2010

/Rena L. Dye/
Supervisory Patent Examiner, Art Unit 1782